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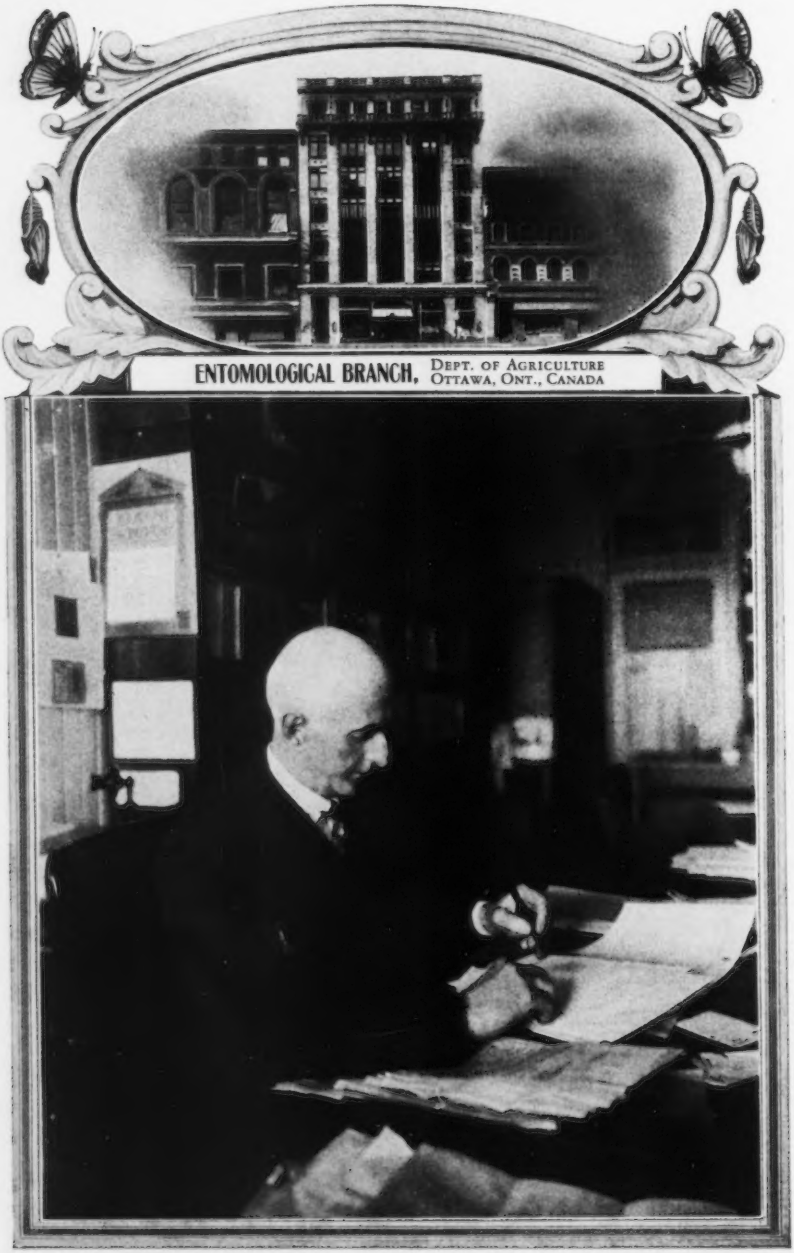


ARTHUR GIBSON

ENTOMOLOGICAL NEWS

VOL. XLI. JUNE, 1930 No. 6

North American Institutions featuring Lepidoptera. XV. Entomological Branch, Department of Agriculture, Ottawa, Ontario, Canada.

By J. D. GUNDER, Pasadena, California.

(Plates XVII, XVIII).

Most friendly relations have existed for many years between the entomologists of the United States and Canada. There is little natural barrier between the countries and their questions of economic and systematic importance are similar. An example of the mutual and beneficial co-operation in the matter of insect control is shown by the conferences which have been held during recent years to devise ways and means of fighting the European corn borer and other pests. Fortunately the official entomologists of both countries have been men of high character and free from certain stupid personalities of excessive nationalism.

Canada first appointed a special entomologist in 1884, but the real development and expansion of the work did not begin until about 1909 when the dreaded brown-tail moth was found in shipments of nursery stock from France. This necessitated the passing of special legislation in 1910, giving the Agriculture Department power to inspect plant products entering Canada, and to take such means as were considered advisable to prevent the spreading of harmful insects already prevalent. By 1914 entomology had developed to such an extent that a separate sub-department of the Government's Department of Agriculture was set aside under the title of Entomological Branch and headquarters were established in the Birks Building[1] at Ottawa

[1] This six-story building is down-town in the business section and the offices of the Branch occupy the upper floors, the lower floors being devoted to various commercial businesses and shops. Although the location is convenient, there is always that hazard of fire which would destroy, not only departmental records, but insect collections as well. If types are at least separated into separate drawers or cabinets, they can perchance be carried out in time. I have in mind the destruction by fire of the

where they remain today. The present divisional organization consists of the following well-known officials: Arthur Gibson, Dominion Entomologist and Head of Branch; J. M. Swaine, Associate Dominion Entomologist and administrator of the Division of Forest Insects; H. G. Crawford, Chief of the Division of Field Crop and Garden Insects; L. S. McLaine, Chief of the Division of Foreign Pests and Suppression ,and J. H. McDunnough, Chief of Division of Systematic Entomology.

Mr. Arthur Gibson was born in Toronto in 1875 and has been in the service of the Canadian government for over thirty years. He entered the Federal Department of Agriculture in 1899 as assistant in the division of botany and entomology at the Experimental Farm, Ottawa and in 1908 was promoted to the position of chief assistant entomologist. Upon the death of Dr. Hewitt in 1920, Mr. Gibson was made Dominion Entomologist and head of the Entomological Branch, a position which corresponds to that at present held by Dr. Marlatt and formerly by Dr. L. O. Howard. Mr. Gibson is a very able organizer and a thorough entomologist and Canada is fortunate to have had for so many years such a capable executive in office.[2]

Dr. James H. McDunnough is known to practically every entomological student in this country and abroad because of his splendid work in the Order Lepidoptera. Few systematists have had the chance, or the ability, to accomplish as much as he has. I think he deserves to be called a builder of great Lepidoptera collections.

From 1909 to March 25, 1919, Dr. McDunnough was curator of the William Barnes collection at Decatur, Illinois and he was the first man to systematically arrange this largest of boreal American collections. One of the results was the Barnes & McDunnough Check List of 1917. This list was not a repro-

Academy of Sciences in San Francisco which was similarly located. Had the lepidopterous types of Behr and others been separated out of the main collections, they could have been saved. Certain insect types which were separated, WERE SAVED. I call Mr. Gibbon's attention to the point of type-separation and also, for example, to the arrangement for valuable types which the American Museum has inaugurated.

[2] Photo Plate XVII, showing Mr. Gibson at his desk, was unfortunately reversed in the original making. Mr. Gibson is not left-handed and also he is much better looking than the photo would give him credit for being!

CANADA

duction, like many of the older lists, but was original in revision and today the moth, or Heterocera, portion continues to be the latest available compilation. While at Decatur he also revised the Cossidae and the *Olene* group of moths, in addition to writing many smaller papers with Dr. Barnes. Mr. Foster H. Benjamin once told me that working on Lepidoptera under Dr. Barnes was "like taking a post-graduate course, you really began to make fewer mistakes".

When Dr. McDunnough went to Ottawa, in April, 1919, to take charge of Canada's budding National Collection of Insects and to devote himself to its systematic study, he found plenty to do. There were many thousands of insects in unclassified condition which had to be sorted into families and genera; the specimens needed systematic transfer into additional steel cabinets in order to have them available for future study and there was only a small entomological library, scarcely suited to the demands of a systematist. How rapidly Canada's collections have been built up is noted in a recent article by Dr. McDunnough, when he says—"I am proud to say that today we have a National Collection of Insects which ranks among the leading collections of the North American continent and a taxonomic library which is not only one of the finest specialized libraries in Government service, but also probably the best of its kind in Canada".

The insects are housed in more than 30 steel cabinets which contain approximately 1600 drawers apportioned as follows: 625 for Lepidoptera; 250 for Coleoptera; 225 for Diptera; 200 for Hymenoptera; 50 for Hemiptera; 50 for Orthoptera; 75 for Odonata; 50 for Ephemeridae and 25 drawers for various Neuropteroid insects. There are also several cabinets containing alcoholic material of Arachnida, Odonata and Ephemerida and slide-cabinets for material in plant-lice, fleas, thrips, etc. The following Lepidoptera collections of note contribute towards the general collection: Dr. James Fletcher collection, excluding types which were deposited in Washington, D. C.; Capt. Gamble Geddes collection consisting of general material collected in the vicinity of Sudbury and Trenton; C. H. Young collection purchased in 1913 and the result of twenty years'

collecting near Ottawa, being rich in Microlepidoptera and containing some paratypes in the Pyralidae and Tortricidae; Arthur Gibson collection of general Lepidoptera with many bred specimens; F. H. Wolley-Dod collection, especially good in western Noctuidae and the J. W. Cockle collection (purchased) from Kaslo, British Columbia, consisting of Mr. Cockle's moths and all of his types.

Up to the present and since being with the Entomological Branch, Dr. McDunnough has published in the neighborhood of 100 taxonomic papers and has described nearly 250 new Lepidoptera and Ephemerida (may-flies). The types of nearly all of these are deposited in the National Collection. Each summer, as time permits, the Doctor makes profitable field trips into western districts and unexplored territories. Much of northwestern Canada remains virgin to the entomologist and he hopes to work out these areas.

Dr. McDunnough has been editor of the Canadian Entomologist since 1921. He was born at Toronto, Ontario on May 10, 1877, receiving an A. M. at Queens College (Canada) and his Ph.D. at Berlin in 1909.

Everybody would like to see published, a Check List (if possible, annotated) of Canadian Lepidoptera and such a list is *very much* needed. A well-edited catalogue on where to go, when to go and what to collect in Canada would be a most valuable contribution as published by the Entomological Branch. Such a paper might be the means of renewing interest in Lepidoptera.

A New Butterfly Aberration (Lepid.: Nymphalidae).

By K. M. Fender, McMinnville, Oregon.

Phyciodes mylitta (Edw.), n. aberr. **macyi.**

I have caught an aberration of *mylitta* that I shall call *macyi,* the main difference between this and *mylitta* being on the underside of the secondaries. All the spots in the limbal area are fused into one broad silvered line. *Macyi* has the same expanse as *mylitta.*

Type: McMinnville, Oregon, one specimen, September 6, 1929, in the author's collection.

Type Fixation.

By MORGAN HEBARD, Academy of Natural Sciences,
Philadelphia, Pennsylvania.

In the January ENTOMOLOGICAL NEWS[1] appeared a caustic attack by W. S. Blatchley on the fixation of single types of two of his species by T. H. Hubbell. Blatchley has well defined a "type" in the modern restricted sense now generally accepted, but evidently does not appreciate the vast difference between marking a specimen as such and its valid published first fixation.

The unique type (sometimes termed holotype) is all important we agree, and Blatchley's present trouble is entirely due to his failure to designate such types in his descriptions of new species published in his "Orthoptera of North-Eastern America" in 1919. Such action he knew at that time to be generally considered of the utmost importance, indeed it has been a requisite in all publications of the American Entomological Society since 1914.

He now says he has expected to publish fixations of the types of all his species in a single paper, but as eleven years have passed since the description of the species discussed, we are not nearly as surprised as he to find that someone else is first in making these selections. That he had labelled a specimen of each species "type" in his collection might have been a factor in choosing the proper specimen as type, but more than one specimen of the original series of a species has aften been labelled "type" in the past and labels can be removed or shifted. The fact remains that, *until the single type of a new species has been designated in print, each specimen included without query in the originally described series must be considered a cotype. Any such specimen may be chosen as type and the first published designation of such (by the author of the species or anyone else) fixes the type of that species irrevocably.*

As Hubbell's is the first fixation of the type of the species *Ceuthophilus davisi* and *Ceuthophilus rehebi* (described by Blatchley in 1919) and is based in each case on a cotype in the Davis Collection (from which the original series came), that

[1] Volume XLI, pages 17 to 19.

action is valid and is not in any way affected by Blatchley's belated attempt to fix as these types specimens in his own collection, made paratypes for all time by Hubbell's earlier and first published fixation.

Whether he likes or not, Blatchley's negligence has forced another to select these types and *if the type of a species has not been indicated in the original description and a specimen, included without query in the originally described series, is subsequently indicated in print as the type of that species, all subsequent type designations are thereby invalidated* and have no significance whatever.

Blatchley states that he neither knows nor cares what the ruling of the Entomological Code may be in a situation such as his present dilemma. We are satisfied that Hubbell has obeyed the rules for single type selection and that his action will be upheld.

As a matter of fact, as the selector has the right to choose any cotype, has not Hubbell made the wisest choice in each case in taking a specimen from the series of cotypes belonging to the collection which was the source of that entire series, rather than from one of the cotypes given to the describer in return for the work he had done? Such is indeed the almost universal practice today between institutions or between individuals.

We have asked James A. G. Rehn for any further comments he might have on this matter and he has furnished the following:

Mr. Blatchley in his arguments evidently declines to admit that an individual author has no more control over a species once published by him than any other student. Once given to the world, a species is world property without prior lien, and if the original author failed to indicate a single type and he or anyone else has not done so in the intervening time, any investigator can designate any one of the *originally* studied series as the single type, no matter where it may be located, provided that it was before the describer at the time of description. Mr. Blatchley's contention would return to Philadelphia quite a few insect types which have since been fixed in the collections of

other Institutions, although the main series on which the species were based, and so labelled "type", are in the Academy of Natural Sciences. Therefore our remarks are not inspired by opposition, but instead by the practice of entomologists at this time, and the universally recognized right of any of the original material to be selected as the single type by any investigator, the published fixation being the court of last resort.

Behavior Notes on the Yellow Jacket, Vespa germanica (Hymen.: Vespidae).

By PHIL RAU, Kirkwood, Missouri.

(Plate XIX.)

While no opportunity has presented itself to make a complete study of this widely distributed wasp, these desultory notes on certain aspects of its behavior may be of interest in making us better acquainted with this already familiar little terror of summer picnics, commonly known as the yellow-jacket. That it is a familiar figure, we all know; that it is of general distribution is evidenced by the reports that it is common throughout the United States, in Europe and Canada.

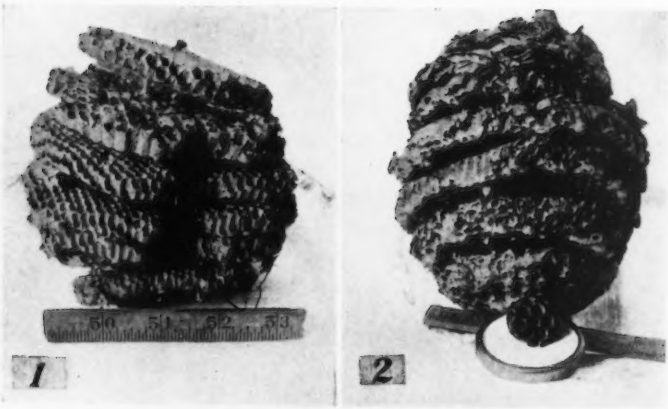
One colony of *V. germanica* was discovered at Wickes, Missouri, on September 2, 1920. A hole in the ground, three-fourths inch in diameter, went down to the roof of this nest, which was two and one-half inches below the surface of the ground. The burrow containing this nest was almost apple-shaped, four inches deep and three to three and one-half inches in diameter. The whole nest had probably been covered, or the pocket in the ground lined, with a layer of paper, like the covering of a *V. maculata* nest, for many scraps of this material lay at the bottom, but people had poured water into this hole and otherwise tried to exterminate the wasps, and this maltreatment had probably broken up this covering sheath. The nest itself consisted of three combs, one atop the other, and connected by strong props or pedicels.

The nest was opened at 9 a. m. and a cyanide jar placed in the opening. During the next two hours, about twenty wasps returned; this gives an indication of the number out of the

nest at that hour in the morning. In opening the nest forty-nine workers and one queen were found; this makes an adult population of approximately 69 workers and one queen; no males were found at that date. During the next two hours, no workers returned, so one can safely place the population of this colony at 70 individuals. Besides this, 64 sealed cells, 25 large larvae and 20 eggs composed the well-filled nest. Both the top and the bottom tier of cells were almost empty; 95 per cent. of the life was in the middle comb.

The nest was taken home and placed in a cage. Within the next two days, 10 workers emerged, quite active, despite the inverted position of the nest. They ate honey greedily, and were often found with their heads inserted deep into the empty cells. They were quite friendly, and soon came like pets after molasses. Later a large stable fly was crushed and placed on the nest; soon it was found that the thorax was completely eaten out but the head and abdomen remained untouched. Thus they were fed daily on molasses and grape jelly and seemed contented; they walked about on the nest, always active and alert, but never attempted to fly out.

Two nests were excavated at the end of the season, and figs. 1 and 2, Plate XIX, show the full-sized nests just before the disbanding of the colony. The nest in fig. 1 was built in a depression in a terrace facing a busy street; the hollow was enlarged from time to time by the wasps carrying out pellets of dirt in their jaws and dropping them while in flight. This nest, inverted in the figure to show construction of the cells, was 5¼ inches high and had six large combs, and in addition a small one 2x2 inches at the bottom (not shown in fig.). This nest was unique in that the papery covering, which usually envelopes the entire nest, was thin and sparse everywhere except the place where it was needed most, the portion of the nest exposed to the street. Here not only was it heavy, thick and well constructed, but it was colored a light yellow to match beautifully the clay of the terrace. Other nests of this species were made of a dark gray material very unlike this one in color. It was so difficult to distinguish the nest from the bank that in



BEHAVIOR NOTES ON YELLOW JACKETS.—RAU.

taking the nest I jabbed my trowel into the nest thinking it was the terrace. Figure 3 shows this clay-colored paper-wall with opening in the center amid the surrounding bank and shows an ideal condition of protective coloration. One can hardly give the wasps credit for consciously making this color selection. Very likely the whole fabric was accidental, or at least got its start that way. The wasps probably fell heir to a light-colored wood pulp and in addition, in their duties of carrying out mud pellets, some mud may have gotten mixed with the saliva, or pulp.

While most nests have round combs, as in fig. 2, nest in figure 1 had each comb indented at the same point, so as to form a sort of stairway from comb to comb making it quite easy of access to the workers.

The nest in fig. 2 was unearthed by Mr. A. F. Satterthwait of Webster Groves, Missouri. The height of the nest was 5½ inches and had 5 large combs, and in addition a small one of 15 cells at the very bottom.

This nest too was taken at the end of the season, and therefore was a full-grown nest. This nest was reached by the inhabitants through a hole in the flat surface of the earth, and had its enormously thick paper sheets, not at the side of the nest as in fig. 1, but at the top where it would serve better for protection from the elements. The thickness of this papery roof was in excess of one inch.

The wasps seem not to know when the season nears its close, and there is an enormous waste of immature life when cold weather approaches. At the end of the season one often finds many cells in course of construction, and enormous numbers of eggs and larvae, which can never reach maturity.

It is well known that these little creatures are scavengers, but I have not been sure heretofore that they attack and kill other insects for food. At last one morning at an early hour I saw one of them in the road attacking a red-winged moth; hence it seems that this wasp, besides picking up bits of dead animal remains, also gets live prey by direct attack. In this case the wasp evidently had attacked prey that was in torpid condition due to the chill of the night. When I crept near and ex-

amined it, I found a goodly chunk had been bitten out of the side of the thorax, with the fore-wing and leg still attached. The wasp proceeded to bite off the wing and then the leg, and discarded them; it then took up the fleshy part of the portion bitten out, mounted into the air in a flight of orientation and flew to a tree near by, thence away. Since she had taken her flight of orientation, I expected her to return, so I stealthily examined her moth; it was still soft, and beside it lay the discarded wing, and also the head which she had amputated.

True to my expectations, she returned after five minutes, flew direct to her moth, removed the left hind wing and then struggled to get rid of the right ones. She then removed a large mouthful of choice meat from the abdomen, flew to the tree as before and away to the northwest. After just four minutes she again returned, flew direct to the carcass and got another portion with a leg still attached to it; with this she repeated her course, to the tree and thence away again to the northwest.

During her absence of five minutes, I thought to do a little experimenting. All this time I had been sitting on the ground about eighteen inches from her morsel, and my paraphernalia less than a foot from it. I suspected that she had associated me and mine with the location of her property; therefore I removed, bag and baggage, six feet to the north. My removal must have caused some confusion, for it took her five minutes to find what she sought. She took her morsel and departed by her established route. After six minutes she returned. In the interval I had placed a green leaf over the abdomen of the moth and moved its bright-colored wings an inch away. Upon returning, the wasp flew to the wings, examined them and tried to bite off a tiny bit of muscle tissue at the base, walked away a moment, returned and again scrutinized the wings and surroundings, this time more excitedly, until quite by chance she discovered the carcass under the edge of the leaf. She began to bite off another portion as before, when an accident occurred which added to the interest of the experiment. A dog ran past and put her to flight. She flew away in a huff, and fluttered about in the vicinity for two minutes, and when she returned she again came to the bright wings, bit at them and examined them

just as before and flew away, came back and explored the region on foot repeatedly and for twenty minutes seemed to try her utmost to locate her lost property. She had left without a flight of orientation after she had found it under the leaf, and although she was absent only two minutes before she tried to come back to it, she could not tell where it lay. Then I removed the leaf, whereupon she found it almost at once and proceeded to get her morsel. These disturbances and tricks may have taxed her patience too much, or her wants may have been satisfied; at least she returned no more. The moth proved to be a female heavily laden with eggs; this is the first intimation I have had that this little wasp, commonly regarded as an enemy, may be of economic value.

Another *V. germanica* was found early in the morning feeding on a grasshopper, *Daucus carolina*. The victim often moved its wings violently, showing it had just been stung. It was an adult hopper, many, many times as large as the assailant, but the cold night had made it sluggish and hence easy prey to an alert hunter. Another was seen to sting an adult hopper, follow it in its agonized flight and sting it repeatedly until lost from view. These wasps were at other times seen crowding around a grasshopper carcass enjoying the flesh for food.

Several *V. germanica* came to a cedar tree in the yard early one September morning, evidently in search of food. While watching them, I saw a *V. maculata* pounce upon one of them. The pair struggled violently for several seconds; then I placed them in a test tube. Even there the *V. maculata* continued the angry onslaught, and when at last they became separated, the little victim gave a few feeble kicks and was dead. Despite the severe sting, *V. germanica* occasionally falls prey to the dipterous robber fly. On September 10, a yellow species of robber fly was seen flying from plant to plant with a worker wasp of *germanica* dangling from its legs, and Bromley records (Psyche **21**: 194, 1914) having taken 17 specimens of this wasp from *Proctocanthus philadelphicus*.

As late in the season as October 19, more than a hundred of these workers were congregated on a dry picnic plate trying to derive some invisible food therefrom. Near by lay some blue

grapes, untouched and intact. I split the skins of these and put them on the plate, and in a minute all the wasps were eagerly crowding over each other to get at the dainties. It is surprising that these famished workers did not see, or having seen they could not break through the tough skins of the fruit to get at its juices.

There has been some discussion as to whether ants, bees and wasps can communicate with one another; especially whether, if one insect finds a store of good things, it is able to communicate with others and advise them of its location. Lubbock proves that ants have this power, but if this wasp can do likewise, I failed to see evidence of it in a case that came under my observation. For two days I watched an individual come to the clay bank in quest of prey and leave each time with a chalcid parasite in her mouth. She would come and go, and never did I see more than that one there. If she had made known this supply to the others, they surely would have come in numbers, but only this one appeared at intervals of ten or fifteen minutes. This one followed a regular system in her hunting; she would alight at one end of the bank near the top, and then fly sidewise, close to the bank and facing it, directly to the other end, bobbing up and down on the wing all the way. Occasionally she would dodge down, searching crevices or burrows for a moment, or leap at her prey in midair; if unsuccessful, she would repeat the search in the same way. The chalcids were so abundant here that she had little difficulty in finding them; her main trouble seemed to be that they were so minute that they could easily get away. Sometimes she took her prey direct to her nest, but more often she clung to the wall and went through the motions of turning it over and biting it—a performance which appeared absurd on account of the small size of the prey.

EXPLANATION OF PLATE XIX.

Figs. 1 and 2. Nests of *Vespa germanica*.

Fig. 3. The nest shown in Fig. 1 in the terrace showing how the hollow was walled up with paper sheets resembling in color and roughness the surrounding soil.

Gall Wasps and the Species Problem.[1]

By H. M. Parshley.

We all describe new species and presumably know what we are doing and what we are dealing with; and yet, to quote a favorite remark of my old friend Charles W. Johnson, the way to start a hopeless and endless argument is to ask any group of taxonomists the simple question: What is a species? Since Darwin explained the origin of species and De Vries wrote about elementary species, the science of genetics has grown up and made plain a whole realm of knowledge that was largely unknown and unsuspected by those investigators and which, it is fair to say, remains unknown or at least unused by a majority of modern taxonomists. Meanwhile geneticists have come to agree as a matter of course that the evolution of species has occurred and is occurring by means of mutations, while old school naturalists, when they refer to mutations at all, are wont to deny that these, the only known hereditary modifications, produce new forms that can be given specific rank. It appears that true species are supposed to contain some vague essence apart from mutational characters, and hence remain controversial and indefinable though recognizable to the initiated eye.

This situation has given rise to the academic dogma that species are groups of organisms demarked for "purposes of convenience." Young students are customarily informed that the lofty and forbidding structure of taxonomy is just a filing system, arbitrarily divided into more or less orderly compartments into which, "for convenience", the infinitely varying and eternally overlapping items of nature are more or less reasonably assorted. If a student observes two related species which nevertheless seem to be perfectly distinguishable, he is reminded that somewhere or sometime intermediate forms undoubtedly might be found, that the law (or rather the dogma) may be fulfilled. There has been in the minds of taxonomists an uneasy feeling that somehow a clean distinction between two groups is in a sense immoral, that apparent limits of variation must

[1] Contributions from the Department of Zoology, Smith College, No. 165.

be illusory. All this, of course, represents the enduring and often unconscious effect of early teachings in Darwinian evolution by infinitesimal gradations, an effect which persists in spite of what is definitely known about mutation. As a matter of fact, there is not the slightest reason to suppose that groups of organisms, whether species or higher categories, must always merge into each other by insensible graduations, either in space or in time; and it is now certainly in order to repudiate this dogma and to cease from imposing it on students and applying it to the materials of taxonomic study. Species are natural segregations, when properly understood, as distinct in nature as they are in our cabinets and catalogues.

That the adoption of this principle does not at once solve all problems is abundantly shown in Dr. A. C. Kinsey's recent book on the species of the genus *Cynips*;[2] but this monograph shows with equal clearness how illuminating this principle is when applied thoroughly to adequate materials. Here is a highly specialized group of insects, occurring over a wide area of the earth's surface, extremely numerous and accessible to the collector, and possessing available characters of a physiologic as well as of a morphologic nature. It should be said also that in Professor Kinsey the group has a remarkably assiduous and discerning student. Now what emerges as the result of this unusual combination of mind and matter?

In the first place, the material basis of this study is adequate beyond that of almost any other taxonomic work you may choose to compare with it. The pinned specimens of the insects numbered more than 17,000 (of which 16,899 are in the author's possession and available for qualified inspection), the galls about 54,000. In twelve years the author has traveled more than 32,000 miles to collecting specimens and geographic data, and he has employed an efficient system in taking true and representative samples. More than 100 collectors in Europe and America have contributed their findings. Out of 93 forms the author has examined the holotypes of 80, 7 not being in exist-

[2] The Gall Wasp Genus Cynips, A Study in the Origin of Species. Indiana University Studies, Vol. XVI, Nos. 84, 85, 86; Waterman Institute for Scientific Research Publications No. 42. 577 pp., 429 figs. 1930.

ence. His descriptions, including agamic and bisexual forms, literature, synonymy, distribution, inquilines, parasites, discussion, etc., average perhops four pages each; and there are 429 figures, including maps, whole insects, galls, and morphologic details. There is a key, lists of pre-occupied names and excluded species, general and special bibliographies, and an index. All done with the highest regard for honesty and accuracy and without regard for expense of time, trouble, or money.

Many specialists in other groups will want to examine the descriptive portion of the work with minute care and will be sure to find something of value for their own investigations and methods of expression; but I venture to say that all biologists who are at all interested in evolution, genetics, and species formation will do well to study and reflect upon the introductory essays in Part I. These deal especially with the origin of species, the taxonomic method, the species concept, mutations, physiologic species, the isolation of species, hybridization, and phylogeny. They are highly condensed and I do not propose to do them the injustice of further compression here, but shall content myself with the statement of a few of the main ideas.

The taxonomic method would soon be restored to dignity if Kinsey's principles were to find general application. These include intensive treatment of restricted phylogenetic units regardless of arbitrary geographic or national limits; the use of numerous specimens collected to show real ranges; consideration of physiologic as well as morphologic variations, with especial effort to distinguish mutations; careful regard for the various degrees of relationship; and an intelligent use of findings from other fields of scientific research. Such principles cannot be employed in hasty "revisions" and certainly have no application in the haphazard description of novelties about which practically nothing is known. And it is the common absence of these qualities that has marked out ordinary taxonomic work for the scorn of biologists in general.

Systematic zoologists will observe with interest the rather curious predicament in which Kinsey finds himself, admittedly, as a result of his work with gall wasps. He has arrived at a

definite understanding of the species concept, but his nomenclatorial problem is not solved, as he frankly admits (page 24). After remarking that individuals show variation and that also "there are many more points of uniformity than of variation among individuals taken from a given locality and habitat," he says

> Finally, the limits of variation of any character prove to be strikingly uniform throughout the great populations which we propose to call species. Whenever we have taken a reasonably large sample from any point over the usually considerable range of a species, the biometric data have not proved fundamentally different from the data for any other fair sample from any other point in the range.

This leads to the genetic definition of a species as "a population with common heredity." Such a population, having a common store of genes which express themselves as mutant characters and the graded variations caused by multiple factors, must constitute a genuine taxonomic entity "which is more than a few cabinet specimens or a bottle full of experimental material or a Latin binomial in a textbook"—and by no means the arbitrary unit of "convenience" of which we have heard so much. And now for the unsolved problem.

The word "species," as just defined, refers to the biologic species, the fundamental category of living things which are biologically identical and thus constitute a single "kind." But hybridization between these real species, and various degrees of relationship among them, give rise to a number of categories that must be recognized between the lowest and what in entomology is ordinarily called a genus. Kinsey talks of his 93 "species" when engaged in biological discussion, but in his descriptive section and in his checklist he gives 26 nomenclatorial species, under which the rest are listed as "varieties." This is simply and solely a concession to existing customs and codes, which is made only because Professor Kinsey hesitates to propose a new taxonomic category with a new name between the true species (temporarily called variety by him) and the genus. The reader must keep in mind this predicament; and if he does

so, no confusion need arise while we wait for some one to answer the author's call with a proposal "that will coördinate biologic concepts of species with questions of convenience in systematic botany and zoology."

Reading this magnificent piece of scientific work, all who have published monographs of similar general character must feel a deep sense of admiration and an even deeper sense of their own short-comings, as I most certainly have in comparing my *Essay on the American Species of Aradus* with the "Gall Wasps." But each one will doubtless know how to justify his course with some degree of satisfaction. In truth, the "species" of certain groups (of *Aradus,* for example, I tend fondly to imagine) may well correspond in large part to the biologic species that Kinsey has so clearly demonstrated in *Cynips.* And certainly it would be impossible, in many groups, for the investigator, however able and zealous, to discover the body of data on mutations, hybridization, reproduction, and physiology which makes Professor Kinsey's work take on at once the proportions of a classic. But there it stands, along with Dunn's *Plethodontidae* and a few other works, an example of what can be done, and must be done, if taxonomy is to be anything more than a convenient means toward efficiency, if it is to take a respectable place as a branch of modern biology .

Dynastes tityus (Scarabaeid) in Pennsylvania and the Rathvon and Auxer Collections of Coleoptera.

By PHILIP P. CALVERT, University of Pennsylvania, Philadelphia.

Several years ago, when bringing together data on the zoological significance of eastern Pennsylvania and New Jersey, my attention was attracted to the following passage, by Prof. S. S. Haldeman, in the Section on Zoology of Charles B. Trego's *Geography of Pennsylvania,* 1843, page 79:

> Pennsylvania is the northern limit of Scarabaeus tityus, the largest beetle found here, which is about two inches in length, of a yellowish gray colour, spotted with black. We have met with but one native specimen.

I was interested to learn the records of this species in Pennsylvania and the present paper gives the results of my search. I am greatly indebted to Mr. Charles Liebeck of Philadelphia and, through him, to Mr. A. B. Champlain, of the Bureau of Plant Industry, at Harrisburg, for references to the literature, and to both of them, to Professors R. C. Schiedt, H. H. Beck and M. Carroll, of Franklin and Marshall College, and to Mr. W. S. Fisher, of the United States National Museum, for reading the manuscript of this paper and suggesting improvements in it.

The earliest record of *Scarabaeus* (*Dynastes*) *tityus* as occurring in this state seems to be the inclusion of the species in Fred. Val. Melsheimer's *A Catalogue of Insects of Pennsylvania Part First,* Hanover, York County, 1806. On Page 1, "Tityus, Fabr." [1] appears as the ninth species of the list, under the third genus *Scarabaeus*. No locality is given for this or any other species. Mr. Banks has kindly informed me that in the Melsheimer Collection, now in the Museum of Comparative Zoology, at Cambridge, Massachusetts, there is only one specimen of *tityus* and it has no locality label. Mr. Warren S. Fisher writes that the United States National Museum is "fortunate in having a copy of Melsheimer's *Catalogue* from the Melsheimer library. In this copy are a great many handwritten notes, probably made by one of the Melsheimers, but these notes do not give any additional information on *D. tityus.*"

The second record, that published by Thomas Say in Volume I of his *American Entomology,* 1824, in connection with Plate IV (pages not numbered) is much more definite. He says of *Scarabaeus tityus*:

This insect is so extremely rare in Pennsylvania, that the late Rev. F. V. Melsheimer, the parent of Entomology in this country, and a very industrious collector, found but two individuals in eighteen years. An instance has however occurred, in which the appearance of a considerable number of them occasioned no little surprise in the neighborhood where they were discovered. A mile or two southward of Philadelphia, and near the

[1] So Melsheimer, but the species was first described by Linnaeus, Syst. Nat., (12th edit.), II. p. 542, Nr. 5, 1767. "Habitat in America septentrionali".

river Delaware, an old cherry-tree was blown down by a violent current of wind, and my informant saw the remains of numerous individuals, in and about a cavity of the tree, laid open by the shock of its fall. That there might be no mistake as to the species, he exhibited the thorax of a male he had chosen from the mutilated fragments.

As to the precise locality from which Say's specimens came, Mr. Liebeck writes to me: "After due reflection, based on the city's possible southern limit in 1824 and the then natural environment, I judge the specimens were found somewhere between South and Mifflin Streets, which was all natural elevated ground above tide-water effects and more in conformity with the breeding habits of an insect of this kind."[2] In the last quarter of the nineteenth century, the southern part of Philadelphia, where it was not built up, was the scene of the collecting labors of Mr. Liebeck, the late Henry W. Wenzel and other well-known coleopterists. None of them ever found *tityus* in this region, as Mr. Liebeck assures me, and I have a memorandum that Mr. Wenzel told me on August 8, 1924, that he knew of no other Pennsylvania record than that of Haldeman which I showed to him.

The next specimen observed in point of time may have been that referred to by Prof. Haldeman in the *Geography* of 1843 quoted above, or it may have been one of those seen by Dr. S. S. Rathvon, of Lancaster, as related in a manuscript communication published by Dr. J. A. Lintner in 1891.[3]

The first specimen of *D. tityus* I ever saw (a female) was in the possession of the late Judge Libhart of Marietta, Pa., in 1839, and was captured near Wrightsville, York County, Pa.

[2] William Allen's "Plan of the City of Philadelphia and Adjoining Districts in 1828" (Library, Histor. Soc. Penna.) supposedly shows the built-up parts of the city by shading, and the southern limits of buildings thus indicated are: between Swanson and Front Streets, down to, but not south of, the Navy Yard, which occupied the area between Prime and the present Wharton Sts., Front St. and the Delaware River; between Front St. and Moyamensing Road, to the line of Johnson's Lane, which, as a lane, extended from Moyamensing Road west to Fifth St. between Wharton and Reed Sts.; west of Moyamensing Road, not south of Carpenter St., except for a few scattered buildings.

[3] Seventh Rept. on the Injurious and other Insects of the State of New York, Albany, p. 253.

Twenty years later, I received a male specimen that was captured in the same county opposite Marietta which is about three miles above Wrightsville . . . In 1859 or 1860 a large willow tree was blown down by a storm at the village of Safe-Harbor in the county of Lancaster. The trunk, inside, was much decayed, and in it were found about twenty specimens, and a number of larvae. I did not learn of this for a week or ten days thereafter, and was only able to secure a single pair, from a person in Lancaster city who obtained them on the spot. . . . I subsequently came into possession of a female which had been captured near New Holland about ten miles east of Lancaster. The largest specimen that I have ever seen from this state was taken within our city limits in 1870. This one, a male, I kept alive in a wire cage for several days, but he eventually forced some of the wires apart and made his escape and was never recovered. In 1873, in a wood about three miles northeast of Lancaster city . . . under the bark in the rotten wood, I secured three very large specimens of larvae which I believed to belong to *Dynastes*." [These larvae were lost on his way home.]

Dr. Asa Fitch mentioned in 1859 [4] that he had specimens of *tityus* from Pennsylvania; one is tempted to conjecture that he may have received them from the sources which supplied Rathvon.

The Reverend Daniel Ziegler collected Coleoptera at or near Kraeutz Creek, six miles from York, Pennsylvania, and doubtless at other localities in York County. He was born at Reading, Pennsylvania, in 1804, and died at York, in the same State, in 1876. With Haldeman, E. F. Melsheimer and John G. Morris, he composed the Entomological Society of Pennsylvania of 1842 and succeeding years. His collection also is now in the Museum of Comparative Zoology, and Mr. Banks writes that in it are three specimens of *Dynastes tityus* "and one of them has the usual blue label with the word *tityus* across the top, and below that on the right the initial F for the author and

[4] Noxious Insects of New York, Rept. 3, p. 49. Mr. K. F. Chamberlain, Assistant State Entomologist, writes from the New York State Museum at Albany (March 11, 1930): "We have your letter of February 25 regarding Pennsylvania records of *Dynastes tityus* in the collection of Dr. Asa Fitch. I regret very much that we cannot confirm these records since we do not have any of the Fitch Coleoptera. Some fifty or sixty types of Hemiptera together with a few butterflies represent all of the Fitch material that we have."

on the left the male sign. Below that is the word Pa., which indicates, of course, Pennsylvania." [5]

Dr. John Hamilton, in his *Catalogue of Coleoptera of Southwestern Pennsylvania* of 1895 [6] states that *tityus* was found at Jeannette, Westmoreland County, by H. Klages, and Mr. Champlain wrote that "a specimen is in our collection labeled 'Jeannette, Pa., H. G. Klages—June'."

Lastly, Mr. Warren S. Fisher writes (March 15, 1930): "There are no Pennsylvania specimens of *Dynastes tityus* in the U. S. National Museum collection, but about 1904 I collected a single specimen of this species at my home, Highspire, Dauphin County, Pennsylvania. Unfortunately I can not give you the exact date as my collection was destroyed by fire. It was the only specimen I found, although I collected in that vicinity for many years."

To ascertain whether any of Rathvon's specimens of *tityus* were still in existence, the writer made a visit, on June 29, 1925, to Franklin and Marshall College, Lancaster, Pennsylvania, where Rathvon's collection is preserved. Thanks to Prof. Mitchell Carroll, of the Department of Biology, and Prof. Herbert H. Beck, of the Department of Chemistry, I was enabled to examine the collection at my leisure and with the following results.

The collection occupies one hundred boxes in cases on the top floor of the College Museum. The boxes measure 25.3 x 33 x 6.75 cm., have glass tops and are tight-fitting. Thirty-six of them are in a case marked "Div. W", which was constructed to hold one hundred; the remaining sixty-four are in flat museum cases. On the end of one of these cases is the inscription: "The S. S. Rathvon Collection of Beetles. Presented by Dr. Henry Bobb of East Greenville, Pa., in memory of his son Eugene, an honored alumnus of F. & M." Most of the specimens bear a circular blue label, 4 mm. in diameter, without any

[5] Hagen has a biographical sketch of Ziegler (Can. Ent. 17: 132-133, 1885, reprinted in 16th Ann. Rept. Ent. Soc. Ontario, p. 22, 1886). For Ziegler's collection, see Hagen, Can. Ent. 16: 196-197, 1884. For the Entomological Society of Penna., see Morris, Amer. Jour. Sci. (2) i: 27, 1846; Can. Ent. 13: 186, 1881.

[6] Trans. Amer. Ent. Soc., xxii, p. 337.

lettering upon it. Some have a circular green label of the same size. Many specimens also bear numbers, *e. g.*

Tetraopes basalis	1492	circular	blue	label
Tetraopes annulatus	5161	"	"	"
Tetraopes ornatus	2954	"	green	"
Dorcadion fuliginosum	2079	"	"	"
Cicindela duodecemguttata	19	"	blue	"
Cicindela dorsalis	9	"	"	"
Cicindela modesta	1935	"	"	"

Other specimens bear locality labels, as some of those now to be quoted. In box No. "44 Dynastidae," I found the following specimens of *Dynastes tityus:*

(1) ♀ 45 mm. long, ms. label "Dynastes tityus ♀ fnd near Wrightsville, Yk. Co., Pa.," ms. label "Georgia, also round blue label.
(2) ♂ 47 mm. long, ms. label "York Co. Pa.," also round blue label.
(3) ♀ 42 mm. long, ms. label "York Co., Pa.," also round blue label.
(4) ♂ ms. label "Dynastes tityus ♂ Ken. [?] 863", also round blue label.
(5) ♀ ms. label "Dynastes tityus ♀ Ken [?] 863", also round blue label.
(6) ♂ ms. label "Georgia", also round blue label.
(7) ♀ ms. label "Dynastes tytius ♂ [sic] Lin 862, also round blue label.
(8) ♂ Printed label "L. T."
(9) ♀ no labels.
(10) ♂ 42 mm. long, label "863 Va."

I was not sure that the handwriting of the first label quoted above for specimen No. (1) is the same as the handwriting of the label "Georgia" of the first specimen and of the labels of specimens (2) and (3); these last three labels were surely written by the same hand.

Mr. Fisher comments thus: "The numbered specimens in the Rathvon Collection are probably the numbers assigned to the specimens by Rathvon for his numerical catalogue cited below, which was probably only partially completed and lost after his death. I have tried to check up these numbers but they do not

correspond to any of the numbers used in the published catalogues."

On comparing this list of specimens with Rathvon's communication to Lintner, one is tempted to believe that the first specimen is Judge Libhart's female of 1839 and that the additional label "Georgia" has been carelessly transferred from another specimen; that the second is the male "captured in the same county opposite Marietta", received "twenty years later". Here, however, the possibilities of identification apparently cease.

A catalogue of the Rathvon Collection is preserved at the Museum. It was not accessible at the time of my visit, but Prof. Beck, Director of the Museum, gave me the following information concerning it in a letter of July 14, 1925:

Rathvon's "Catalog" is an alphabetically constructed list of the cases in which the different species are stored. There is at the beginning a brief history of the collection (by S. S. R.). He started collecting in 1842. The cabinet contains a portion of the collection of Prof. Hentz, late of Alabama, begun by him about 1815. Hentz sold his collection to Prof. Haldeman (in 1840). The small colored disks attached to the pins of all the insects are general indications of locality, blue—North America, purple—South America, green—Europe, yellow—Asia, etc. The historical account ends with: "A few State localities are attached to some of the insects, but this is more fully detailed in a numerical catalogue of species which in due time will be made to accompany the cabinet." This was probably never made.

At another point S. S. R. says: "The insects from Pennsylvania in this collection were mainly obtained along the southwestern margin of Lancaster County and the N. E. border of York C. A few were obtained from northwestern Pennsylvania but the larger number from the State are from the valley of the Susquehanna, near Marietta and the hills on both sides of the river from Bainbridge to McCall's Ferry. During the last ten years (from 1865) some additions were made to the collection from the vicinity of Lancaster City and the Conestoga."

There is no further information about numbers 862 and 863 which Dr. Carroll had asked me to search for particularly.

(To be continued.)

Tsetse Flies—Past and Present (Diptera: Muscoidea).

By J. Bequaert, Harvard University Medical School,
Boston, Massachusetts

(Continued from page 164.)

I believe that the psychology of the flies should also be considered. Of course, my mentioning "psychology" in connection with tsetses cannot fail to elicit a smile from those of my readers to whom all animals—and especially insects—are pure mechanisms, some kind of glorified alarm-clocks. Yet I claim that the tsetse is an animal with what Professor Forel would call "a well-balanced mind." To be sure, it might fail miserably if subjected to any of the "intelligence tests" devised by modern psychologists for army recruits or terrestrial snails. But in tropical nature, with its many contingencies and hazards, our *Glossina* moves about fearlessly and manages to thrive notwithstanding the handicap of extremely slow reproduction. During the many tedious hours which I have spent travelling up and down the African rivers, I have had plenty of opportunity to watch the behavior of *G. palpalis*. What impressed me most was the unobtrusive, yet deliberate manner in which it stalks a prospective victim.

There are many features in the external and internal anatomy of tsetses showing the high degree of specialization to which I have alluded before. Unfortunately it is not possible to enter into many anatomical details. The mouth-parts, the digestive tract, and the reproductive organs offer perhaps the most striking peculiarities, some of which are of importance in connection with the rôle of the flies as vectors of disease. In the proboscis, the mandibles and maxillae have disappeared, the labrum and labium forming together a slender, needle-like tube, which encloses the very long hypopharynx. At rest the proboscis is placed horizontally between the palpi; but, when about to bite, it is lowered into a vertical position, the palpi remaining in the original place. The skin is pierced by the movements of the labella at the tip of the labium and the proboscis is thrust as far as its bulbous base will permit into the tissues of the victim, as a rule quite rapidly.

The statement is frequently made that the bite of the tsetse is unusually painful and that, when a fly is infected with trypanosomes, the spot where it bites will swell up and become inflamed. Personally I have found the immediate reaction to the bite to be extremely variable: sometimes it was felt at once, even before the fly had a chance to suck blood; but often it was entirely overlooked. I have reached the conclusion that many factors influence the reaction of the victim, such as individual sensibility, the distance of a bite from a nerve, the temperature, the number of flies, and others. I have often observed *G. palpalis* completing its meal on the leg of a native or on the nose of a dog, without the fly being in the least disturbed. In most cases the only reaction of the tissues near the bite is an itchy feeling of short duration; sometimes there is a little swelling, and very rarely the bite is followed by considerable oedema persisting for a long time. On one occasion in the Belgian Congo, some twenty years ago, my entire left hand was very badly swollen following the bite of a single *G. palpalis;* but as no ill-effects followed, I cannot regard this as a symptom of the fly having been infected with disease.

In the digestive tract the unusual development of the salivary glands and of the crop is most noteworthy. The crop, when filled to capacity, extends to unbelievable proportions. In a series of experiments with flies fed on blood in capillary glass tubes, my friend Dr. J. Rodhain and his co-workers found that in one meal *G. morsitans* absorbs between 0.05 and 0.09 c.c. of liquid. *G. palpalis* may even be more voracious, since Macfie calculated that a female of this species is capable of imbibing 1.6 times her body weight of blood, and a male 1.3 times his body weight. The complicated process of digestion has recently been studied by Lester and Lloyd (1928). During feeding, the salivary glands secrete a powerful anticoagulin, which delays the clotting of the blood while stored in the crop. As the blood passes from the crop to the midgut, a coagulin secreted in the mesenteron rapidly clots it, in order to retain the food in that region of the alimentary tract while draining and assimilation take place.

(To be continued)

Notes on Utah Vespidae (Hymen.).[1]

By C. Lynn Hayward.

The following paper is one of a series of reports to be made on the Hymenoptera of Utah in the collection of the Brigham Young University. This collection has accumulated as a result of several summer expeditions conducted by the Department of Zoology and Entomology under the direction of Dr. Vasco M. Tanner. These expeditions have now covered the major part of the state of Utah and have also extended somewhat into the surrounding states. Some private collectors have also contributed specimens to this collection.

It is the purpose of this paper to report the species of Vespidae belonging to the subfamilies Masarinae, Polybiinae, Polistinae and Vespinae now represented in the Brigham Young University collection. Although this report includes chiefly the Utah species, specimens taken in surrounding states are also listed. It is thought that the collection is complete and extensive enough to be fairly representative of this region; however, further collecting will probably result in an extended known range for some of the forms, and will doubtlessly reveal some additional species especially of Masarinae.

In preparing this distributional list, the writer has used the classification suggested by Dr. J. C. Bequaert (1918) in his *Vespidae of the Belgian Congo,* except that at his suggestion the subfamily name Polybiinae has been used in place of Epiponinae and the genus name *Vespula* instead of *Vespa.*

The writer wishes to express appreciation to Dr. Bequaert for his assistance in the determination of certain doubtful specimens and for his many helpful suggestions, and to Dr. Vasco M. Tanner, head of the Department of Zoology and Entomology, Brigham Young University, for his assistance and encouragement.

Subfamily Masarinae.

1. Pseudomasaris (Toryna) vespoides Cress. Utah: Glendale, July, 1927, two males (Call); La Sal Mountains, June,

[1] Contribution number twenty from the Department of Zoology and Entomology, Brigham Young University, Provo, Utah.

1927, one male (Kartchner); Ute Mountains, Utah-Colorado line, two males (Tanner); Provo, May, one male (Cottam); Uinta Mountains, Grandaddy Lakes, August, 1926, three females; Aspen Grove, Timpanogos, one female (Tanner); Bryce Canyon, June, 1926, one female, (Rasmussen); Zion National Park, one female (Liddle).

WYOMING: Burnt Fork, June, 1926, one male (Brown).

IDAHO: Paris Peak, Bear Lake County, five females and eight males, July, 1929 (Hayward).

P. vespoides is apparently the commonest masarid occurring in the mountainous regions of Utah and surrounding states. The writer has seen this species in great numbers on Paris Peak, July 25, at an elevation of about 9,000 feet. They were visiting flowers of *Pentstemon* sp. at the time they were observed.

2. PSEUDOMASARIS (PSEUDOMASARIS) MARGINALIS Cress. UTAH: Bear Ears, Elk Ridge, June, 1927, one male (Tanner).

3. PSEUDOMASARIS (COTYLEDON) EDWARDSII Cress. UTAH: Zion National Park, June, 1929, three males and one female, (Tanner); Wellsville Canyon, June, 1926, one female (Hayward); Deep Creek Mountains, June, 1928, one female (Tanner); Logan, July, 1928, four females (Hayward).

4. PSEUDOMASARIS ZONALIS Cress. IDAHO: Paris Peak, Bear Lake County, July, 1929, one male (Hayward).

5. PSEUDOMASARIS *sp.* UTAH: Aspen Grove, Timpanogos, two females (Tanner); Provo, one female (Kartchner).

The three specimens listed above do not satisfactorily run to any of the species described in Dr. Bradley's key. They conform most closely with *P. occidentalis* Cress., but differ from this species in a number of important respects. The three specimens in the collection apparently agree very closely with each other in both morphological characters and coloration.

(To be continued)

A New Textbook of Entomology.

Prof. Dr. H. Weber, now at the Technische Hochschule, Free City of Danzig, has in preparation a *Lehrbuch der Entomologie,* to be published by G. Fischer at Jena, and will be glad to receive papers bearing on this subject.

On the Seventieth Birthday of Dr. Adelbert Seitz.

— Wohl sind Keinem unter all die Blüten
Rosen ohne Dornen eingestreut;
Aber glücklich ist, wer dennoch sinnig
Sich des Schönen, Hohen, Wahren freut;
Ihm ersteht, in wunderbarem Glanze,
Jede Blume im Erinnerungskranze.

PHILIPP HAIMBACH,
Der Kranz der Erinnerung.

From the pen of A. V. Herff, a friend of his youth, we extract the following from "The life of Dr. Adelbert Seitz":

Dr. Seitz was born of a noble family of Mainz, on February 24th, 1860, being the youngest of three children. Through the influence of his father he became interested in nature study in his sixth year; he was, however, soon to lose this guiding spirit, as his father died when Adelbert was but eight years old. After this he lived with his mother at Darmstadt, until her death, which occurred when she was past ninety years of age.

In 1871 he matriculated at the Darmstadt Gymnasium, and in 1879 at the Bernheim Gymnasium, whence he graduated. In 1880 he entered the University of Giessen, where he studied medicine and natural history, especially zoology, and there received his degree in 1885 as Doctor of Medicine and Philosophy.

In 1886 he absolved his military duties, and in 1887 made a voyage to Australia, to study the fauna of that country; being without means, he traveled as the ship's doctor, and as at that time ships would remain in port for weeks at a time, he had the opportunity in Sydney to meet William MacLeay. This benevolent gentleman took him on a number of excursions into the interior, and it was there that he conceived the thought of writing his great work, *Die Grossschmetterlinge der Erde.*

In 1888 he made his first trip to Brazil; in 1890 he turned toward the East, visiting Japan, and then the Ethiopian region, and from then on he never rested, having now 59 voyages to his credit, including his present one to Brazil.

In 1892 he accepted the directorship of the Zoological Garden at Frankfurt on Main; at this time the financial condition of the garden seemed almost hopeless, several years preceding showing an annual deficit, and with no money on hand with which to purchase animals for the garden. Within ten years of his incumbency the garden had procured a rhinoceros, a hippopotamus, more than forty ostriches, sixteen giraffes, dozens of leopards, over one hundred kangaroos, and many of the larger species of apes.

In 1908 Dr. Seitz retired from his position as Director of the Zoological Gardens, receiving a liberal pension; he then returned to Darmstadt, when and where he began his life's work, *Die Grossschmetterlinge der Erde*. It was diligently carried on, and many parts were published, until the interruption caused by the great world war. For a number of years the publication was much curtailed but, thanks to the indefatigable spirit of the editor, normal production has again been resumed and parts are coming along regularly.

Of no less importance are his many published narratives on his various expeditions, which deal not only with the faunas of the countries visited, but also with the countries themselves, their peoples and customs. Noteworthy also among his writings are *Allgemeine Biologie der Schmetterlinge, Seidenzucht in Deutschland,* numerous papers on *Das System und Phylogenie der Schmetterlinge,* and many others, all of which are original and characteristic of this versatile man, who stands in the first rank among the entomologists of all nations.

With all his knowledge and many achievements, Dr. Seitz is extremely modest, entirely unselfish, and always willing to assist others.

We join with his many friends and admirers in wishing him continued health and strength to carry on his chosen work.

(The late) FRANK HAIMBACH, Philadelphia.

Preliminary Report on Nomenclature Proposals.

In the December issue of ENTOMOLOGICAL NEWS, XL, 1929, pp. 329-333, Dr. C. W. Stiles, Secretary of the International Commission on Rules of Zoological Nomenclature, has published a series of proposals concerning suggested changes in the International Rules.

A special committee on Nomenclature has been appointed by the Entomological Society of America to study these proposals and make a report. A preliminary report is here presented for your consideration. If you have suggestions, either affirmative or otherwise, please transmit the same to the chairman of our committee, Dr. T. D. A. Cockerell, University of Colorado, Boulder.

(1) (1930B) We favor the 5/6ths amendment, which prevents the blocking of proposals by a single individual.

(2) (1930D) We believe the "elimination" principle is unworkable as a rule.

(3) (1930F) We think the "binary" papers should be rejected, except certain early ones which have been currently accepted.

(4) (1930G) We do not favor taking the 12th instead of the 10th edition of the Systema Naturae as the starting point. The date 1758 has long been accepted, and to change now would cause great inconvenience.

(5) (1930H) Publication. It is very important to settle more precisely the meaning of the term publication, as applied to taxonomic works.

(a) Take the case of privately printed papers with new species, only to be obtained through the favor of the author. According to the rules, they are not published. (See the controversy between Hay and Osborn concerning priority in publishing a fossil elephant. Osborn claims that Hay has no priority, as his paper was privately printed and not sold.)

(b) Trouble has also occurred with reference to the distribution (by private favor) of separates prior to the publication of the work from which they are taken. But if the separates are placed *on sale* prior to the publication of the whole part or volume, apparently they are validated.

(c) A technical difficulty arises in the case of works widely distributed (especially to libraries) but not sold; thus for example the Memoirs of the U. S. National Academy, and the publications of many Experiment Stations. Usually they later appear on the market second hand, but at the time of original distribution they may be considered not technically published, though it seems that in practice they are always admitted. It might be recommended that part of the edition should always be placed on sale.

(d) More precise definition of a lay journal seems desirable. It has been suggested that "Nature" is not to be recognized as a place of publication for new names. Few, however, would go so far as this. (cf. the famous "Erlangen list" as a case in dispute.)

(e) It really seems necessary, or seems that it will eventually be necessary to take further steps to define "publication." Papers may now be published in the most obscure places, and technically "placed on sale" while remaining quite unknown to zoologists. It might be held necessary (as under the copyright law) to deposit copies in at least

a certain number of central libraries, which would stamp them with the date of receipt.

(f) Date assumed correct unless *proved* incorrect. In a good many cases *proof* is impossible, but the presumption one way or the other is very strong. We think that in such cases the nearest approximation to the truth must be accepted.

(6) We strongly support *oidea* as the ending for superfamily names. Here is a point: some authors (*e.g.* Van Duzee in his Catalogue of Hemiptera) consider that a higher group name (family, etc.) dates from the first proposal of the group with a name, regardless of whether that name was in the form now current. Some hold that it dates only from the first publication in proper (as now considered) form. This should be definitely settled. There are good cases in Hemiptera and Odonata.

(7) We think the Poche proposals are not desirable.

T. D. A. COCKERELL,
H. H. KNIGHT,
J. M. SWAINE.

(A) A matter which ought to be dealt with is this: what constitutes the designation of a type specimen? It ought to be obligatory to label the holotype, and state the type locality (if more than one locality is given) in publication. When no designation appears in publication, and the "species" was a mixture, should a private mark override the work of a reviser who gives the characters of the two or more species involved, and restricts the name to one of them? Can a reviewer designate the type locality from among two or more given, and does that designation hold, in the absence of any printed indication to the contrary?

T. D. A. C.

(B) Could we or should we ever adopt a rule that in the case of possible rival names for a species, when the indications are not quite clear, that name should be preferred which is based on a type deposited in a large public museum? There is, and will be, an increasing incubus of species badly described (often in the wrong genus) by more or less irresponsible persons, sometimes for the sake of increasing the number of "types" in private collections. It is a difficult problem.

T. D. A. C.

List of the Titles of Periodicals and Serials Referred to by Numbers in Entomological Literature in Entomological News.

1. Transactions of The American Entomological Society. Philadelphia.
2. Entomologische Blätter, red. v. H. Eckstein etc. Berlin.
3. Annals of the Carnegie Museum. Pittsburgh, Pa.
4. Canadian Entomologist. London, Canada.
5. Pysche, A Journal of Entomology. Boston, Mass.
6. Journal of the New York Entomological Society. New York.
7. Annals of the Entomological Society of America. Columbus, Ohio.
8. Entomologists' Monthly Magazine. London.
9. The Entomologist. London.
10. Proceedings of the Ent. Soc. of Washington. Washington, D. C.
11. Deutsche entomologische Zeitschrift. Berlin.
12. Journal of Economic Entomology, Geneva, N. Y.
13. Journal of Entomology and Zoology. Claremont, Cal.
14. Entomologische Zeitschrift. Frankfurt a. M., Germany.
15. Natural History, American Museum of Natural History. New York.
16. American Journal of Science. New Haven, Conn.
17. Entomologische Rundschau. Stuttgart, Germany.
18. Internationale entomologische Zeitschrift. Guben, Germany.
19. Bulletin of the Brooklyn Entomological Society. Brooklyn, N. Y.
20. Societas entomologica. Stuttgart, Germany.
21. The Entomologists' Record and Journal of Variation. London.
22. Bulletin of Entomological Research. London.
23. Bollettino del Laboratorio di Zoologia generale e agraria della R. Scuola superiore d'Agricultura in Portici. Italy.
24. Annales de la société entomologique de France. Paris.
25. Bulletin de la société entomologique de France. Paris.
26. Entomologischer Anzeiger, hersg. Adolf Hoffmann. Wien, Austria.
27. Bolletino della Società Entomologica. Genova, Italy.
28. Ent. Tidskrift utgifen af Ent. Föreningen i Stockholm. Sweden.
29. Annual Report of the Ent. Society of Ontario. Toronto, Canada.
30. The Maine Naturalist. Thornaston, Maine.
31. Nature. London.
32. Boletim do Museu Nacional do Rio de Janiero. Brazil.
33. Bull. et Annales de la Société entomologique de Belgique. Bruxelles.
34. Zoologischer Anzeiger, hrsg. v. E. Korschelt. Leipzig.
35. The Annals of Applied Biology. Cambridge, England.
36. Transactions of the Entomological Society of London. England.
37. Proceedings of the Hawaiian Entomological Society. Honolulu.
38. Bull. of the Southern California Academy of Sciences. Los Angeles.
39. The Florida Entomologist. Gainesville, Fla.
40. American Museum Novitates. New York.
41. Mitteilungen der schweiz. ent. Gesellschaft. Schaffhausen, Switzerland.
42. The Journal of Experimental Zoology. Philadelphia.
43. Ohio Journal of Sciences. Columbus, Ohio.
44. Revista chileña de historia natural. Valparaiso, Chile.
45. Zeitschrift für wissenschaftliche Insektenbiologie. Berlin.
46. Zeitschrift für Morphologie und Ökologie der Tiere. Berlin.
47. Journal of Agricultural Research. Washington, D. C.
48. Wiener entomologische Zeitung. Wien, Austria.
49. Entomologische Mitteilungen. Berlin.
50. Proceedings of the U. S. National Museum. Washington, D. C.
51. Notulae entomologicae, ed. Soc. ent. helsingfors. Helsingfors, Finland.
52. Archiv für Naturgeschichte, hrsg. v. E. Strand. Berlin.

53. Quarterly Journal of Microscopical Science. London.
54. Annales de Parasitologie Humaine et Compareé. Paris.
55. Pan-Pacific Entomologist. San Francisco, Cal.
56. "Konowia". Zeit. für systematische Insektenkunde. Wien, Austria.
57. La Feuille des Naturalistes. Paris.
58. Entomologische Berichten. Nederlandsche ent. Ver. Amsterdam.
59. Encyclopédie entomologique, ed. P. Lechevalier. Paris.
60. Stettiner entomologische Zeitung. Stettin, Germany.
61. Proceedings of the California Academy of Sciences. San Francisco.
62. Bulletin of the American Museum of Natural History. New York.
63. Deutsche entomologische Zeitschrift "Iris". Berlin.
64. Zeitschrift des österr. entomologen-Vereines. Wien.
65. Zeitschrift für angewandte Entomologie, hrsg. K. Escherich. Berlin.
66. Report of the Proceedings of the Entomological Meeting. Pusa, India.
67. University of California Publications, Entomology. Berkeley, Cal.
68. Science. New York.
69. Comptes rendus hebdoma. des séances de l'Académie des sciences. Paris.
70. Entomologica Americana, Brooklyn Entomological Society. Brooklyn.
71. Novitates Zoologicae. Tring, England.
72. Revue russe d'Entomologie, Leningrad, USSR.
73. Quarterly Review of Biology. Baltimore, Maryland.
74. Sbornik entomolog. národniho musea v Praze. Prague, Czechoslavokia.
75. Annals and Magazine of Natural History. London.
76. The Scientific Monthly. New York.
77. Comptes rendus heb. des séances et mémo. de la soc. de biologie. Paris.
78. Bulletin Biologique de la France et de la Belgique. Paris.
79. Koleopterologische Rundschau. Wien.
80. Lepidopterologische Rundschau, hrsg. Adolf Hoffmann. Wien.
81. Folia myrmecol. et termitol. hrsg. Anton Krausse. Bernau bei Berlin.
82. Bulletin, Division of the Natural History Survey. Urbana, Illinois.
83. Arkiv för zoologie, K. Svenska Vetenskapsakademien i. Stockholm.
84. Ecology. Brooklyn.
85. Genetics. Princeton, New Jersey.
86. Zoologica, New York Zoological Society. New York.
87. Archiv für Entwicklungs mechanik der Organ., hrsg. v. Roux. Leipzig.
88. Die Naturwissenschaften, hrsg. A. Berliner. Berlin.
89. Zoologische Jahrbücher, hrsg. v. Spengel. Jena, Germany.
90. The American Naturalist. Garrison-on-Hudson, New York.
91. Journal of the Washington Academy of Sciences. Washington, D. C.
92. Biological Bulletin. Wood's Hole, Massachusetts.
93. Proceedings of the Zoological Society of London. England.
94. Zeitschrift für wissenschaftliche Zoologie. Leipzig.
95. Proceedings of the Biological Soc. of Washington, Washington, D. C.
96. La Cellule. Lierre, Belgium.
97. Biologisches Zentralblatt. Leipzig.
98. Le Naturaliste Canadien. Cap Rouge, Chicoutimi, Quebec.
99. Mélanges exotico-entomologiques, Par Maurice Pic. Moulins, France.
100. Bulletin Intern., Académie Polonaise des Sci. et des Lett. Cracovie, Poland.
101. Tijdschrift voor entomologie, Nederlandsche Entomol. Ver., Amsterdam.
102. Entomologiske Meddelelser, Entomologisk Forening, Copenhagen.
103. Journal of the Kansas Entomological Society, Lawrence, Kansas.
104. Revista de la Sociedad entomologica Argentina, Buenos Aires.

(C) We need a rule on the permissible length of names—*e.g.*, that a specific name should not exceed six syllables.

T. D. A. C.

(D) I agree that in the future it ought to be made obligatory to label the holotype and state the type locality in publication. It seems obvious that the designation of type specimens can be made only by publication. Private marks or labels can have no validity until published any more than manuscript names for species. In view of our present system of rules it seems logical that the first published designation of a type (Lectotype) specimen (from among the cotypes) should hold just as it does in the case of designating the type species of a genus.

H. H. K.

Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The numbers **within brackets** [ ] refer to the journals, as numbered in the list of Periodicals and Serials published in the January and June numbers (or which may be secured from the publisher of Entomological News for 10c), in which the paper appeared. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within ( )** follows; then the pagination follows the **colon :**

All continued papers, with few exceptions, are recorded only at their first installments.

*Papers containing new forms or names have an * preceding the author's name.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

☞ ***Note the change in the method of citing the bibliographical references, as explained above.***

Papers published in the Entomological News are not listed.

GENERAL.—Curran, C. H.—Some insects from Barro Colorado. (S) [15] 611-620, ill. **Forbes, S. A.**—Obituary. By H. Osborn. [12] 23: 472-473, ill. **Frost, S. W.**—Collecting leaf-miners on Barro Colorado Island, Panama. (S). [76] 1930: 443-449, ill. **Gleason, H. A.**—A plea for sanity in nomenclature. [68] 71: 458-459. **Howard, L. O.**—Man and insects. [Jour. Maryland Acad. Sci.] 1: 84-89. **McColloch, J. W.**—In memoriam. By R. L. Parker. [103] 3:

51-52, ill. **Stewart, M. A.**—The insect visitants and inhabitants of Melilotus alba. [6] 38: 43-46. **Theobald, F. V.**—Obituary. [8] 66: 92-93; [9] 63: 95-96. **Weiss, H. B.**—Olaus Magnus, credulous zoologist, and archbishop of the sixteenth century. John Buncle's panegyric on the Spanish fly. [6] 38: 35-37; 49-51.

ANATOMY, PHYSIOLOGY, ETC.—Allman, S. L.—Studies of the anatomy and histology of the reproductive system of the female codling moth. [67] 5: 135-164, ill. **Beattie, M. V. F.**—Physico-chemical factors in relation to mosquito prevalence in ponds. [Jour. Ecology] 18: 67-80, ill. **Cavanaugh & Tilden.**—Algal food, feeding and case-building habits of the larva of the midge fly, Tanytarsus dissimilis. [84] 11: 281-287, ill. **Cecil, R.**—The alimentary canal of Philaenus leucophthalmus. [43] 30: 120-130, ill. **Denis, J. R.**—Existe-t-il un dimorphisme dans le sexe femelle chez les Myzine? [24] 99: 15-22, ill. **Dobzhansky, T.**—Genetical and environmental factors influencing the type of intersexes in Drosophila melanogaster. [90] 64: 261-271. **Dolley, W. L.**—The relation between luminous intensity and the length of the refractory period in the eye of Eristalis tenax. [42] 56: 185-191, ill. **Fletcher, F. W.**—The alimentary canal of Phyllophaga gracilis. [43] 30: 109-119, ill. **Gause, G. F.**—Studies on the ecology of the Orthoptera. [84] 11: 307-325, ill. **Grandi, G.**—Contributi alla conoscenza biologica e morfologica degli Imenotteri melliferi e predatori. [Bol. Lab. Ent. 1st. Sup. Agr. Bologna] 2: 255-290, ill. **Grandi, G.**—Studio morfologico e biologico della Blastophaga psenes. [Bol. Lab. Ent. R. Inst. Sup. Agr. Bologna] 2: 314 pp., ill. **Grassé, P. P.**—Etude écologique et biogéographique sur les Orthoptères Français. [78] 63: 489-537. **Haseman, L.**—The hessian fly larva and its method of taking food. [12] 23: 316-321, ill. **Hollande, A. C.**—Remarques au sujet des tératocytes du sang des insectes: origine de ces cellules. [Arch. Zool. Exp. Gen. Notes et Rev.] 69: 1-11, ill. **Howland, L. J.**—Bionomical investigation of English mosquito larvae with special reference to their algal food. [Jour. Ecology] 18: 81-125, ill. **Jahn, L. A.**—The internal anatomy of the mydas fly. [43] 30: 85-97, ill. **Krüger, E.**—Ein beitrag zur mimikryfrage. [17] 47: 13-14. **Lutz & Hicks.**—An analysis by movietone of a cricket's chirp (Gryllus assimilis). [40] 1930: 14 pp., ill. **Maréchal, P.**—Sur trois

Hyménoptères se developpant dans un cocon en mosaïque (Miscophus spurius; Oxybelus bipunctatus; Mutilla rufipes). [Mem. Soc. Ent. Belgique] 23: 23 pp., ill. **Morland, D. M. T.**—On the causes of swarming in the honey bee (Apis mellifera): An explanation of the brood food theory. [35] 17: 137-149, ill. **Pesola, V. A.**—Banaanikärpänen (Drosophila melanogaster) perinnöllisyystieteen palveluksessa. [Luonnon Ystävä] 33: 73-86, ill. **Rau, P.**—Mortality of Polistes annularis wasps during hibernation. [4] 62: 81-83. **Staniland, L. N.**—Presence of a yeast in the death watch beetle. [31] 125:635. **Ulrich, W.**—Die strepsipterenmännchen als insekten mit halteren an stelle der vorderflügel. [46] 17: 552-624, ill.

ARACHNIDA AND MYRIOPODA.—*Bishop & Crosby.—Studies in American spiders: genera Ceratinopsis, Ceratinopsidis and Tutaibo. [6] 38: 15-33, ill. **Bonnet, P.**—Les araignées exotiques en Europe. Observations sur deux Héteropodes de la Guinée et sur deux Mygales de la Guyane, gardées en captivité en France. [24] 99: 49-64, ill. **Jacot, A. P.**—Shorter articles and discussion. Biological notes on the moss-mites. [90] 64: 285-288.

THE SMALLER ORDERS OF INSECTS.—Enderlein, G.—Die klassification der Coniopterygiden auf grund der recenten und fossilen gattungen. [Arch. Klass. Phylog. Ent.] 1: 98-114, ill. ***Jordan, K.**—Two new American fleas. [71] 35: 268-269, ill. **Krawany, H.**—Trichopterenstudien im gebiete der lunzer seen. [Int. Rev. Ges. Hydro. & Hydro., Leipzig] 23: 417-427, ill. **Sikes, E. K.**—Larvae of Ceratophyllus wickhami and other species of fleas. [Parasitology] 22: 242-259, ill.

ORTHOPTERA.—Karney, H. H.—Phylogenetische und tiergeographische erwägungen zur systematik der Rhaphidophorinen. (Gryllacridae). [Arch. Klass. Phylog. Ent.] 1: 57-76, ill. ***Uvarov, B. P.**—Notes on new or less-known Holarctic Decticinae (Tettigoniidae). [75] 5: 400-405, ill.

HEMIPTERA.—*Beamer, R. H.—Two Erythroneura (grape leaf hoppers) damaging apple in Kansas (Cicadellidae). [103] 3: 49-50. **Börner, C.**—Beiträge zu einem neuen system der Blattläuse. [Arch. Klass. Phylog. Ent.] 1: 115-194. **Bueker, E. D.**—Phenacoccus wilmattae. [4] 62: 93-94,

ill. ***Davis, W. T.**—The distribution of cicadas in the United States with descriptions of new species. [6] 38: 53-72, ill. ***DeLong, D. M.**—A new species of bean leafhopper from Haiti. [4] 62: 92-93, ill. **Goding, F. W.**—Synonymical notes on Membracidae. [6] 38: 39-42. ***Lawson, P. B.**—Another season's trap-lighting of leafhoppers. [103] 3: 35-43. **Marshall, G. E.**—Some observations on Orius (Triphleps) insidiosus. [103] 3: 29-32. ***Tuthill, L. D.**—Four new species of the Deltocephalus group (Cicadellidae). [103] 3: 44-47. ***Walley, G. S.**—Heteroptera from the north shore of the Gulf of St. Lawrence. [4] 62: 75-81, ill.

LEPIDOPTERA.—***Bryk, F.**—Zwei neue Sematuriden. (S). [20] 45: 16, ill. ***Niepelt, W.**—Neue falter. (S). [14] 44: 18-19. ***Rober, J.**—Neue falter. (S). [14] 44: 19-21, ill. ***Schreiter, R.**—Contribución al estudio biológico de los Papilionidos del norte Argentino y Papilio argentinus. [Univ. Nac. Tucumán Mus. Hist. Nat.] 2: 19 pp., ill. **Tams, W. H. T.**—A note on certain species of the genus Tirathaba (Pyral.). [22] 21: 73.

DIPTERA.—***Bau, A.**—Vier neue Cuterebra-arten aus Sudamerika. (Oestridae). [56] 9: 81-89. ***Curran, C. H.**—Three new Diptera from Canada. [6] 38: 73-76. **da Costa Lima, A.**—Sobre a revalidação do genero Taeniorhynchus (Culicidae). [Mem. Inst. Oswaldo Cruz] 23: 105-108. **Enderlein, G.**—Der heutige stand der klassifikation der Simuliiden. [Arch. Klass. Phylog. Ent.] 1: 77-97, ill. ***Frey, R.**—Eine neue mittelamerikanische Dipterengattung mit gestielten augen. [51] 6: 44-48. **Johnson, C. W.**—Some notes on mosquitoes. [Bull. Boston Soc. Nat. Hist.] 1930: 16-20, ill. **Keilin & Tate**—On certain semi-carnivorous anthomyid larvae. [Parasitology] 22: 168-181, ill. ***Lengersdorf, F.**—Die ausbeute der deutschen Chaco-Expedition 1925-26. Diptera. Lycoriidae (Sciaridae). (S). [56] 9: 55-59. ***Lindner, E.**—Die ausbeute der deutschen Chaco-Expedition 1925-26. Diptera. Richardiidae. (S). [56] 9: 60-62. **Painter, R. H.**—Notes on Kansas bot flies. (Oestridae). [103] 3: 32-35. ***Prell, H.**—Zur kenntnis von bau und entstehung einiger brutbildtypen bei rindenbrütenden borkenkäfern. [46] 17: 625-648, ill. ***Van Duzee, M. C.**—New species of Dolichopodidae from North America and the West Indies. [4] 62: 84-87.

COLEOPTERA.—Alluaud, C.—Additions aux Carabidae du Coleopterorum Catalogus édité par W. Junk et S. Schenkling. [24] 99: 5-8. **Bertrand, H.**—Captures et élevages de larves de Coléopteres aquatiques. [24] 99: 65-77, ill. **Blair, K. G.**—Oxford University Greenland Expedition, 1928. Coleoptera from Greenland. [75] 5: 394-400. ***Brown, W. J.**—New species of Coleoptera. [4] 62: 87-92. **Dalla' Torre & Voss.**—Coleopterorum Catalogus. Pars 110. Curculionidae: Archolabinae, Attelabinae, Apoderinae. 42 pp. ***Fleutiaux, E.**—Liste des Melasidae de la Guyane Française et descriptions d'espèces nouvelles. [24] 99: 29-47. **Hetschko, A.**—Coleopterorum Catalogus. Pars 107. Colydiidae. 124 pp. Pars 108. Phalacridae, Mycetophagidae, Tretothoracidae, Jacobsoniidae, Cavicoxumidae, Gnostidae. 26 pp. Pars 109. Cucujidae, Thorictidae (Suppl.), Cossyphodidae (Suppl.). 122 pp. **Hofeneder, K.**—Einige beobachtungen an Xenos vesparum (Strepsiptera). [20] 45: 13-16, ill., cont. ***Maulik, S.**—New injurious Hispinae. (S). [22] 21: 45-56, ill. **Roberts, A. W. R.**—A key to the principal families of Coleoptera in the larval stage. [22] 21: 57-72. **Struble, G. R.**—The biology of certain Coleoptera associated with bark beetles in western yellow pine. [67] 5: 105-134, ill. **Trägardh, I.**—Some aspects in the biology of Longicorn beetles. [22] 21: 1-8, ill.

HYMENOPTERA.—*Gahan, A. B.—Synonymical and descriptive notes on parasitic Hymenoptera. [50] 77, Art. 8: 12 pp. **Neave, F.**—Vespula intermedia in Manitoba. [4] 62: 83-84, ill. **Peterson, A.**—How many species of Trichogramma occur in North America? [6] 38: 1-8, ill. ***Schwarz, H. F.**—Anthidiine bees from Oregon with a description of a new species. [6] 38: 9-14.

OBITUARY.

Mr. J. D. Gunder telegraphed to the Editor of the NEWS on May 1: "Dr. Barnes of Decatur passed away this morning." Mr. Gunder devoted his article in our issue for last October to Dr. WILLIAM BARNES and his collection, recording some entomological reminiscences of his subject. In that paper the statement was made that Dr. Barnes' health was not as good as usual and it is with deep regret that we now register his departure from among us.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted—Everes comyntas and amyntula from all parts of N. Am. by purchase or exchange for local lepid. Dr. Edwin P. Meiners, 6600 Delmar Blvd., St. Louis, Mo.

Wanted for Exchange or Determination, specimens of the genus **Eucerceris** of the Hymenoptera, tribe of Cercerini. H. A. Scullen, Department of Entomology, Oregon State Agricultural College, Corvallis, Oregon.

Mordellidae of the world wanted in exchange for North American species. Address Dr. F. J. Psota, 2434 South Crawford Avenue, Chicago, Illinois.

Oxybelinae (Sphecidae, Hymenoptera)—Wanted from all parts of North and South America and West Indies. Will determine, exchange or purchase. V. S. L. Pate, Entomology Dept., Cornell University, Ithaca, N. Y.

Wanted—Names and addresses of collectors of insects, particularly Lepidoptera. Those from foreign countries especially invited. Will pay cash or exchange. Peter M. Casamento, P. O. Box 276, West New York, New Jersey.

Exchange—All groups of Lepidoptera in exchange for Noctuidae of the World. Foreign correspondence desired. A. Glenn Richards, Jr., Roberts Hall, Cornell Univ., Ithaca, N. Y., U. S. A.

Exchange—Lepidoptera of the Northwest for beautiful and showy exotics. C. W. Herr, Priest River, Idaho.

WANTED for cash or in exchange, hibernating pupae, especially Papilios, Saturniidae, Eacles imperialis, Autom. io and others from all parts of the States, Canada and Mexico. Send lists with best prices to Max Rothke, 1846 East Elm St., Scranton, Pa.

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